

Fig. 3. *Schizoporella unicornis*, Johnston. Normal.

Fig. 4. *Schizoporella atrofusca*, Busk.

Fig. 5. *Schizoporella atrofusca*, form *labiosa*.

Fig. 6. *Schizoporella serratimargo*, n. sp. Marginal cells. 6 a. Mature cells and ovicell. 6 b. Marginal avicularium. 6 c. Oral valve. 6 d. Nat. size.

Fig. 7. *Schizoporella Pallasii*, Heller. 7 a. Marginal cell, showing sinus.

Fig. 8. *Schizoporella auriculata*, Hassall. Showing ordinary form of orifice. 8 a. Variety *spathulata*. 8 b. Avicularium of this variety in early stage.

XXVII.—*Hystricrinus*, *Hinde*, versus *Arthroacantha*, *Williams*: a Question of Nomenclature. By GEORGE JENNINGS HINDE, Ph.D., F.G.S.

IN the 'Annals' for March 1885, p. 158, I proposed the term *Hystricrinus* for a genus of Crinoids with movable spines in place of *Arthroacantha*, Williams*, on the ground of the resemblance of this latter term to *Arthracanthus*, Schmarda †, which had been previously employed for a genus of Rotatoria. The essential similarity of these terms seemed to me to bring the case so very clearly within the tenth rule of the British Association Committee ‡, that "a name should be changed when previously applied to another group which still retains it," that it did not seem necessary to advance any arguments to justify the course adopted. But Messrs. Wachsmuth and Springer, in part iii. of their lately issued "Revision of the Palæocrinoidea" §, p. 116, reject my term *Hystricrinus* and reinstate Williams's name, on the ground that "*Arthroacantha* is a different word from *Arthracanthus* although of the same etymology and of similar construction, and there are other names of recognized standing in natural history which bear a closer resemblance to prior names than this" (p. 117).

As the question is of more than the mere personal interest as to who should be the author of a generic name, and as it should be decided in accordance with the rules made to prevent confusion in scientific literature, and with the general practice of reputable scientific authors of the present day, I venture to state the reasons which appeared to me to be sufficient not only to justify, but to necessitate, the substitution of another term for that of Professor Williams. I may first premise that the remarks which may be made upon the invalidity of Prof. Williams's name are not intended in any

* 'Proceedings of the American Philosophical Society,' 1883, p. 84.

† Denkschr. k.-k. Akad. d. Wiss. Wien, vol. vii. 1854, p. 12.

‡ 'Report of the Thirty-fifth Meeting of the British Association for the Advancement of Science,' Birmingham, 1865, p. 33.

§ 'Proceedings of the Academy of Natural Sciences, Philadelphia,' July 1885, p. 116 (separate copy).

way to reflect upon this gentleman, who, in a letter to me of the 13th May last, acknowledging the receipt of my paper on *Hystericinus*, says:—"I agree with you in the impropriety of my generic name [i. e. *Arthroacantha*] and shall adopt yours. It was a provoking accident which caused me to overlook that single page of names applied to Rotatoria in Marshall's index."

As Messrs. Wachsmuth and Springer recognize the rules of zoological nomenclature of the British Association Committee, it may be desirable to give quotations from the particular one bearing on this subject* :—

"It being essential to the binomial method to indicate objects in natural history by means of *two words* only, without the aid of any further designation, it follows that a generic name should only have *one meaning*—in other words that two genera should never bear the same name. . . . When these cases occur the later of the two duplicate names should be cancelled and a new term, or the earliest synonym, if there be any, substituted. . . . It is, we conceive, the bounden duty of an author, when naming a new genus, to ascertain by careful search that the name which he proposes to employ has not been previously adopted in other departments of natural history. By neglecting this precaution he is liable to have the name altered and his authority superseded by the first subsequent author who may detect the oversight. . . . We submit therefore that a name should be changed which has before been proposed for some other genus in zoology or botany, or for some other species in the same genus, when still retained for such genus or species."

Applying the above rule to the present case, we have the names :—

Arthracanthus, Schmarda, 1854. From *ἄρθρον*, joint, and *ἄκανθα*, spine, for a genus of Rotatoria, characterized by movable spines, which serve as oars to the animal.

Arthroacantha, Williams, 1883. Also from *ἄρθρον*, joint, and *ἄκανθα*, spine, for a genus of Crinoids characterized by movable spines.

It is very evident that both these generic terms have one and the same meaning, and this fact would, according to the rule quoted, require that the later one should be changed. If we turn now to the proper construction of these words, there is no doubt that, in accordance with the regular method of forming compound Greek words, Schmarda's term is correct, and that Williams and Wachsmuth and Springer are orthographically in error in retaining the "o" in *Arthroacantha*,

* *Loc. cit.* p. 34.

which must therefore be deleted. We have then the same word for the two genera; but in the one case it is placed in the masculine and in the other in the feminine gender. It is difficult to see the reason why Schmarida should have adopted the masculine termination *-us* instead of retaining the feminine termination *-a* of the Greek *ἄκαραθα*, and exception might fairly be taken to the change, and it would be open to any one to alter the *-us* into *-a*, and thus corrected the word is precisely identical with the corrected *Arthroacantha*, Williams. Schmarida does not seem to have followed any rule respecting the terminations of the generic names, for in the same group he employs *Hexarthra*, *Listrion*, and *Typhlotrocha*; and it may be urged that Agassiz has also modified the terminal *-a* of the same Greek word into *-us* in the case of the numerous genera of fossil fishes which are based upon spines.

Admitting, however, that *Arthroacanthus*, Schm., may be retained in the masculine form, it seems to me that the later term *Arthroacantha*, Will., judging according to the spirit of the rule of the British Association, cannot be valid. It is substantially the same word and unequivocally it has the same meaning as Schmarida's term. To admit it would be the same as allowing that the same Greek word would be applicable to three distinct genera, according to its masculine, feminine, or neuter termination!

Again, if the term were specially suitable to a genus of Crinoids, one might be disposed to allow the infraction of the rule in favour of retaining it; but even Messrs. Wachsmuth and Springer* are constrained to acknowledge that it is "injudiciously chosen."

These same authors, moreover, are not merely content with endeavouring to upset the generic term *Hystericrinus*, but they also assert that the species which I described and figured in the 'Annals' as *Hystericrinus Carpenteri* is "probably a synonym of *Arthroacantha punctobrachiata*, Williams" †. To this I reply that Prof. Williams never professed to describe, and in fact did not describe, a species of this name, that the name is a MS. one of Prof. Hall, and that until the forms have been sufficiently described and published, the species has no recognized existence and cannot be a synonym of *H. Carpenteri*.

Prof. Williams, in the paper referred to above, under the title "On a Crinoid with movable Spines," described a single species which he designated *Arthroacantha ithacensis* ‡. He compared this species with a specimen in the Museum of Cornell University, which had been photographed by Prof. Hall, and the photograph, with the MS. name *Platycrinus*?

* *Op. cit.* p. 116.

† P. 119.

‡ 'Proceedings American Philosophical Society,' 1883, p. 85.

punctobrachiatus appended to it, was privately circulated, but never published. Notwithstanding this, Prof. Hall made a claim to the species; and Prof. Williams, unwilling to disoblige this veteran palæontologist, did not describe the form, but only made the following remarks respecting it* :—

“The arms, the shape of calyx, and the plates that were preserved corresponded in general with the *A. Ithacensis*, but the tubercles on the calyx plates are finer, more numerous, and the pitting very indistinct, and the basal plates are relatively larger than in the typical specimens of that species. Hence we are led to believe that the Hamilton species is distinct from the Chemung specimens, and even if it were properly described and published, it is probably safe to regard it as a distinct species. Although the specimen shows no trace of the free spines†, the nature of the tubercles leaves little doubt of a generic identity with *Arthroacantha Ithacensis*, and the Hamilton form may be called *Arthroacantha punctobrachiata*.” Again, on p. 86 :—“This species [i. e. *A. ithacensis*] differs from the *Arth. punctobrachiata* of the Hamilton group in the more distinct and less numerous tubercles on the surface of the calyx plates; the smaller size of the tubercles leads to the inference that the spines were smaller in the Hamilton form; the calyx plates were apparently thicker in the Chemung species, and the second and third plates of the specimen of *Arth. punctobrachiata* are higher than those of *Arth. Ithacensis*.”

One needs hardly ask the question seriously, whether the above general remarks and inferences, mostly of a negative character, can be regarded as sufficient to define a species. Under the twelfth rule of the British Association it is stated, “two things are necessary before a zoological term can acquire any authority, viz. definition and publication. Definition properly implies a distinct exposition of essential characters, and in all cases we conceive this to be indispensable.” There is evidently no distinct exposition of the essential characters of a species to be obtained from the cursory observations of Prof. Williams respecting Hall’s MS. specimen; and it is clear that if this author had intended to have described *P. punctobrachiatus*, Hall, MS., he would have furnished all the particulars of form, the exact measurements, and the figures, in the same manner as in the species *A. ithacensis*, which he professed to describe, and did so in a very able and satisfactory manner, notwithstanding that his specimen was only a negative cast of the form.

I maintain therefore that Messrs. Wachsmuth and Springer are certainly in error in asserting that *P. punctobrachiatus* is a good species and must be credited to Williams. It seems to

* *Ibid.* p. 83.

† The italics are mine.

me that these authors are doing Prof. Williams an injustice in endeavouring to foist upon him the authorship of a species to which he lays no claim, and which he has not taken steps to establish.

When Prof. Hall properly describes (and publishes) the typical specimen which bears his MS. name of *P. punctobrachiatus*, it will then be seen if it is identical with *Hystri-
crinus Carpenteri*; and in this latter eventuality his MS. name must lapse.

Notwithstanding the scanty imperfect notice of the MS. *P. punctobrachiatus* given by Williams, and the absence of any published figure, Messrs. Wachsmuth and Springer profess to be able to recognize with confidence specimens of it from the Hamilton group of the Province of Ontario; but they are unable to determine their identity with my *Hystri-
crinus Carpenteri*, though this latter form has been minutely described and figured! Still further, these authors recognize the spines of *P. punctobrachiatus*, though none were present in the typical specimens of this form; and yet they cannot tell if they are similar to those of *H. Carpenteri*, although these latter have been carefully figured to scale!

Further comment on the remarkable insight and the peculiar views of Messrs. Wachsmuth and Springer respecting zoological nomenclature is needless. I venture to believe that it has been sufficiently shown that both the generic terms *Hystri-
crinus* and the species *H. Carpenteri* have been formed in accordance with the rules of the British Association; and I therefore append the following summary as an emendation of that given by the above-named authors:—

HYSTRICRINUS, Hinde (=ARTHROACANTHA, Williams, previously occupied).

1885, Ann. & Mag. Nat. Hist. ser. 5, vol. xv. p. 153.

1883. *Hystri-
crinus (Arthroacantha) ithacensis*, Williams, sp. Type of the genus. Proc. Amer. Phil. Soc. April, p. 85, with plate.—Upper Devonian, Chemung group. Ithaca, New York.

1885. *Hystri-
crinus Carpenteri*, Hinde, Ann. & Mag. Nat. Hist. ser. 5, vol. xv. p. 162, with plate and woodcut.—Middle Devonian, Hamilton group. Arkona, Ontario, Canada.

(Besides the above, Prof. Williams mentions a specimen to which Prof. Hall has given the MS. name *Platycrinus punctobrachiatus*. The form has not yet been described and published, and cannot therefore at present be included in the genus. According to Williams, the type-specimen is from the Hamilton group, but no locality is given.)